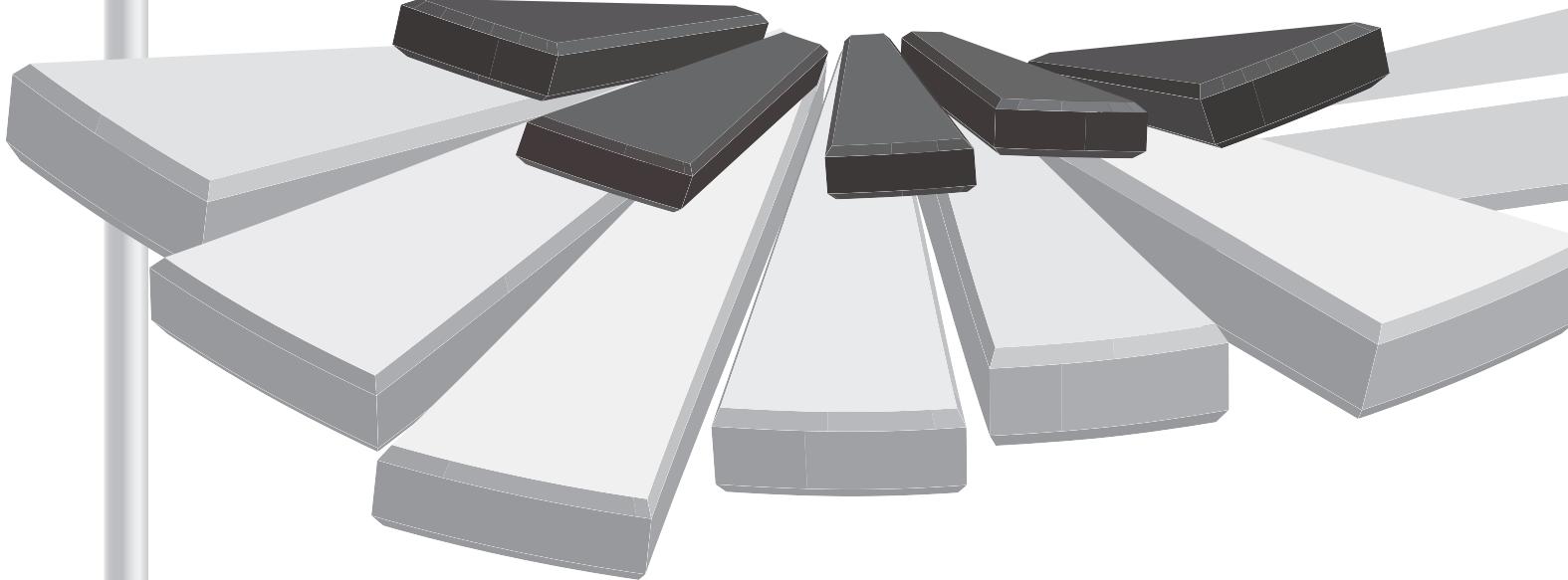


■ MAJ JOSEPH GUZMAN
SMDC, TRADOC CAPABILITY MANAGER
BALLISTIC MISSILE DEFENSE SYSTEMS

SPACE OPERATIONS OFFICERS as Jazz Musicians



Report Documentation Page

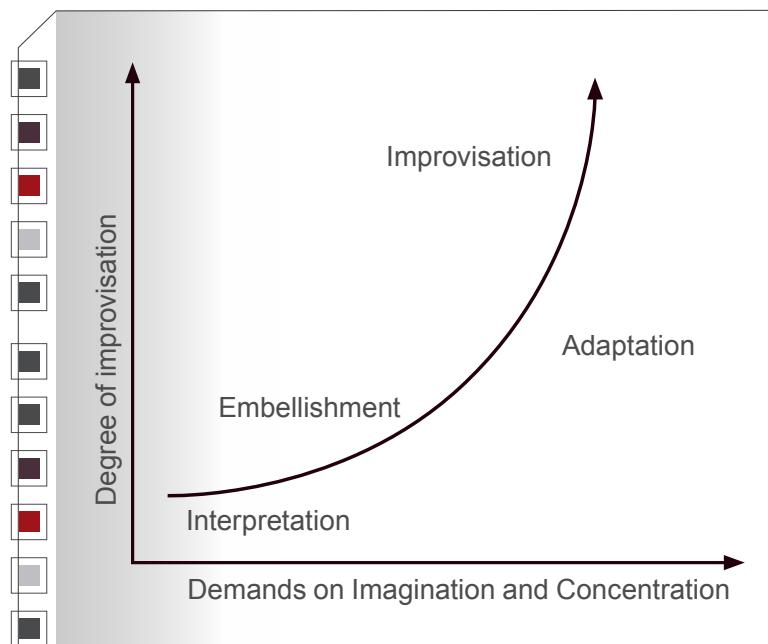
*Form Approved
OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 2010	2. REPORT TYPE	3. DATES COVERED 00-00-2010 to 00-00-2010		
4. TITLE AND SUBTITLE Space Operations Officers as Jazz Musicians			5a. CONTRACT NUMBER	
			5b. GRANT NUMBER	
			5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)			5d. PROJECT NUMBER	
			5e. TASK NUMBER	
			5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Army Space & Missile Defense Command,SMDC/ARSTRAT ,PO Box 1500,Huntsville,AL,35807-3801			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)	
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified		
			18. NUMBER OF PAGES 5	19a. NAME OF RESPONSIBLE PERSON

Figure 1

Improvisation
Continuum



Looking through the lens of “organizations as jazz bands,” I investigate how adding Space Operations Officers (Functional Area 40s) to Corps and Division staffs has enabled them to improvise, which has paid dividends in the contemporary “high-volatility, uncertainty, complexity and ambiguity (VUCA) “ contemporary operating environment. I shall first introduce Karl E. Weick’s concept of improvisation as it relates to jazz and organizational theory. I will then argue that the Army has taken initial, if accidental, steps to adapting to the contemporary operating environment, which dictates a more decentralized approach to organizational design, by adding Space Operations Officers to the staffs of Divisions and Corps over the last five years. Finally, I will offer up suggestions by which FA40s assigned to Corps and Division staffs might develop the potential to play an integral role in combat at the operational level.

Dr. Karl E. Weick argues in his paper entitled “Improvisation as a Mindset for Organizational Analysis,” that organizations exhibit many qualities associated with the art form of jazz music. In the essay, he cites jazz musicians who explain the qualities that define jazz, how they practice the art form and how they develop the capabilities to improvise. Weick defines improvisation as the reworking of “precomposed material and designs in relation to unanticipated ideas conceived, shaped and transformed under the special conditions of performance, thereby adding unique features to every creation.”¹ In order to improvise, Weick argues, Jazz masters make “major investments

in practice, listening and study” in order to create unique works of art under the pressure of live performance.²

Improvisation Continuum

Figure 1 illustrates Weick’s “degrees of improvisation.” Improvisation lies on a continuum which places more demands on the musician’s imagination and concentration as he or she drifts further from the fundamental melody and toward a new artistic expression of an idea.³ This model may be used to appreciate the degree of difficulty associated with playing Jazz. Not only must the artist master the instrument, chords, rhythm and interaction with other musicians and the audience, but Jazz musicians must fully apply the abstract concepts of imagination and concentration to truly improvise. The complexity of interactions between band members and the unpredictability of creating expressions of music in the changing environments of different venues, audiences and even the mood swings of individual artists make jazz a revealing metaphor for combat operations.

In his paper entitled, “The New Military Decision Making Model – A Systems Thinking Approach,” Dr. Chris Paperone offers that our perceptions of the contemporary operating environment continue to expand in terms of VUCA. He argues that simple problems which can be scoped and defined in terms of known solutions can be addressed by highly structured organizations in a “programmatic style.”⁴ For instance, replacing a blown tank engine in a home-station training environment can be accomplished through the cooperation of the crew, the



The Army's first experimental FA40 "Space Operations Officer" CPT Bill McClagan (center). He served, experimentally, as an organic Space Operations Officer with the G3 10th Mountain Division, Fort Polk, La., during Millennium Challenge 2000/Joint Contingency Force Advanced Warfighting Experiment, August 2000.⁸

company maintenance section, and associated support personnel in the battalion. The methods for recovering the inoperable tank, ordering the replacement parts and turning the wrenches are well practiced skills with documented tactics, techniques and procedures. Through routine application of these tactics, techniques and procedures, the problem is solved and the tank is brought back to a Fully Mission Capable status. Conversely, the most complex problems must be handled in an entirely different manner, requiring a different type of organization with a different rule set.

In their seminal article on "wicked problems," Rittel and Webber lay out some of the characteristics of the most complex of dilemmas facing leaders in high-VUCA environments. Wicked problems, according to Rittel and Webber, exhibit the following traits which are echoed in U.S. Training and Doctrine Command Pamphlet 525-5-500, Commander's Appreciation and Campaign Design:

Some Characteristics of Wicked Problems⁵

1. There exists no definitive formulation of a wicked problem. Canned solutions do not exist, which makes even the statement of the problem into a complex endeavor.
2. Wicked problems have no stopping rule. There is no "end" to a wicked problem.
3. Solutions to wicked problems are not true-false (logical in nature), but good-bad (subjective in nature).
4. There is no ultimate test of a solution to a wicked problem. One cannot model all of the variables which may bear on the problem.
5. Every solution is a "one shot operation;" there is no opportunity to learn by trial and error. Every attempt counts significantly.

6. Wicked problems do not have an enumerable set of potential solutions, nor is there a well described set of operations that can be incorporated into the plan.
7. Every wicked problem is essentially unique.
8. Every wicked problem can be considered a symptom of another problem.
9. The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution.
10. The problem solver has no right to be wrong.

An example of a wicked problem is the emergence of Mexican drug cartels over the last forty years. The existence of the cartels represents a threat to citizens living along the U.S.-Mexican border and even deep within the Mexican and American interiors. Furthermore, the cartels over time have interwoven themselves within the very fabric of U.S./Mexican socio-economic structure. To completely eliminate the cartels would wreak havoc on the Mexican economy, destabilize its already fragile political system and cause a major humanitarian crisis, all of which would have adverse effects on the United States. Failure to address the problem could lead to a failed state along the U.S. Southern border. These realities beg the question: How do we frame a problem to which we have no pre-determined solutions? Paperone suggests that a way to approach wicked problems lies in the way leadership shapes the organization. He argues that "high-VUCA" environments demand decentralized, improvisational and adaptable organizations and demand that leaders relinquish the control of operations to subordinate units, perhaps even to individual soldiers. The organization must apply what Paperone calls "emergent decision making."⁶ In short, Army organizations must learn to play jazz.

The Army has always allowed units to interpret and embellish, however, it has yet to get comfortable with operating in the

face of high end demand for improvisation (see Figure 1). The environment, represented in the jazz metaphor as the audience and venue, wants to hear jazz and the “big Army” responds with a play list of cover songs – artifacts like hierarchical organizational structures and attempts to predict the characteristics of future combat. A serendipitous example of Army leadership shaping its organizations toward emergent decision making lies in the fielding of Space Support Elements to staffs at the Corps and Division Level. Ironically, VUCA set the stage for an impromptu jazz session.

In the summer of 2003, the Chief of Staff of the Army, GEN Erik Shinseki, made the decision to “modularize” the force six years ahead of schedule with initial fielding to occur by 2004. The original Army Transformation Plan called for initial fielding in 2010. While the most visible units associated with “modularization,” termed “Units of Action,” are currently referred to as Brigade Combat Teams, other fundamental changes were taking place with respect to the Corps and Division staffs. The transformation plan involved a replacement of three command echelons, the Division Headquarters, Corps Headquarters and Army Headquarters, with two, referred to as “Unit of Employment X” (UEx) and “Unit of Employment Y” (UEy). The UEx was to become the Army’s principle warfighting headquarters, designed to command and control several Brigade Combat Teams or serve as a Joint Task Force Headquarters. The UEy would perform the service component duties of Administrative Control. With an anticipated ten year timeline for the delivery of the first modular units, the Combined Arms Center began running advanced warfighting experiments designed to shape the respective staffs as early as August 2000 with the Millennium Challenge 2000/Joint Contingency Force Advanced Warfighting Experiment. A lone Space Operations Officer, CPT Bill McClagan, participated in the exercised as part of the 10th Mountain Division G3 and advised the command on the application of space based force enhancement including Intelligence, Surveillance and Reconnaissance, Satellite Communications (SATCOM), and Precision Navigation and Timing, among others. The experiment turned out to be a success. Consequently, the requirement for one FA40 on the Division staff expanded to include additional personnel and equipment forming the first Division Space Support Element, with MAJ Dave Hotop serving as Officer in Charge. The experimental Space Support Element exercised with the 82nd Airborne Division Headquarters at Millennium Challenge in August 2002. The experiment again proved successful. A Space Support Element was assigned to the first modular division headquarters, the 3rd Infantry Division, in 2004 and deployed to Iraq from January 2005 to January 2006.⁷ During the same timeframe, FA40s established themselves on Corps level staffs with MAJ Robert Guerrero at III Corps, MAJ Gordon Quick at XVIII Airborne Corps and LTC George Wingfield at V Corps.

With inter-agency and academic experiences to draw from, FA40s brought unique skill sets to the battlefield, but did not have a traditional place on their respective staffs. This created an opportunity for Space Officers to contribute in ways not imagined during the advanced warfighting experiments.

During the Millennium Challenge Experiments of 2000 and 2002, FA40s operated in experimental environments which facilitated the application of “theoretical” Space Force Enhancement, including support to Intelligence, Surveillance and Reconnaissance, SATCOM, Theater Missile Warning and Precision Navigation and Timing. With the Space Support Element Toolkit, FA40s provided their staffs with easy access to map and imagery products, predictions of enemy satellites overhead, early entry Satellite Communications in austere environments and access to Missile Warning Networks. The Space Support Element would essentially eliminate some of the fog and friction of war through the application of technology. The outbreak of war threw a monkey wrench into the plan as BG H.R. McMaster notes in his article, “Learning from Contemporary Conflict to Prepare for Future War.” BG McMaster highlights the flaws associated with trying to predict the qualities and characteristics of future warfare and advocates a close analysis of our recent experiences to determine a way forward.⁹ This closely resembles how a jazz musician analyzes the string of notes he just played to find the best way to “answer his own musical question” with his next run of notes, to “create his form retrospectively.”¹⁰ Needless to say, the contemporary operating environments of Counter-Insurgency Operations in Iraq and Afghanistan did little to validate the predictions of the Millennium Challenge experiments which were based on a large scale conventional conflict.

Our enemies in Operations Iraqi Freedom and Enduring Freedom did not rely on space-based products to any significant degree. As the theater matured, Coalition Force capabilities morphed and adapted. Soon, the SIPRNET spread down to the Company level, allowing unprecedented access to intelligence products and raw data. Hundreds if not thousands of SATCOM dishes dotted Forward Operating Bases as the use of SATCOM became more commonplace. Theater Ballistic Missiles were no longer considered a threat. In short, Space Operations Officers would be better employed elsewhere on staffs; many of the tasks FA40s were designed to do have become normalized, analogous to checking e-mail or submitting collection requirements through established channels. FA40s recognized this as an opportunity to apply their skills to other efforts such as Counter-Improvised Explosive Device, Personnel Recovery, Information Engagement, and Psychological Operations. Space Operations Officers facilitated coordination between other staff elements to create opportunities for numerous small scale successes, all of which combined to form a significant contribution to the campaign. Much like jazz musicians, FA40s interacted well

with other band members, listened to what they were “playing” and tried to complement them. Mistakes were made. Lessons were learned.

Space Operations Officers represent a relatively small percentage of all officers with only 235 FA40s at last count. Chartered primarily to bring “space to mud,” FA40s provide soldiers with leverage from space based sensors and transponders. Secondly, FA40s must bring operational experience back from the battlefield to ensure that the Army’s equities are considered in the development of requirements for the next generation of space assets. However, when an FA40 reports to a Corps or Division Space Support Element job, additional preparations are in order. He or she must be able to join in a jazz “jam session” in progress. The campaign plan provides the fundamental melody from which to diverge. The operating environment provides an audience from which to draw inspiration. The staff and soldiers play the instruments of war.

Weick offers that aspiring young jazz students should “mix listening with history, practice, modeling, and learn[ing] the fundamentals” of their craft in order to become masters.¹¹ In order to deal with the high-VUCA contemporary operating environment, FA40s can benefit their staffs by mastering the fundamentals of their particular fields of expertise. More importantly, the officer must be prepared to apply his or her expertise in innovative ways to create opportunities to exploit the enemy’s weaknesses. Individuals should not only study historical and cutting edge Space Operations in preparation for war, but should also place emphasis on learning about other staff functions. Attending courses such as the Special Technical Operations Planner’s Course, Electronic Warfare Course and Military Deception Course increase the depth of the individual’s appreciation of the Operating Environment, enabling the Staff Officer to better support subordinate units and create staff linkages where none existed previously. Just as individuals can improve their abilities to improvise, organizations can also take steps to enable themselves to deal with high-VUCA situations. The following is a listing of organizational characteristics derived from Weick’s piece which have been adapted to military practice.

Conclusion

In conclusion, the contemporary operating environment, one of high-VUCA, demands that Army organizations be capable of improvisation. To some degree, this fact is recognized among Corps and Division staff officers and commanders. However, we still cling to our branches and sequels like our favorite tunes from our collective glory days. The act of extensive planning provides us with the comfort that we have “done our homework” and we understand our critical capabilities, vulnerabilities and requirements. Despite this, we know that plans go out the window at LD because the enemy and the environment each “have a vote.” Meanwhile, we lose precious time and initiative to our enemies who are proficient in the art of Jazz. We do not have the time to compose a symphony, rehearse and play a flawless performance. Our audience, the operating environment, wants to hear us play Jazz and we must be better than the competition. Traditional planning gives us the time to learn while emergent decision making uses that time to execute inside of the enemy’s decision cycle. In short, be a team player; create opportunities for others. Educate yourself; broaden your appreciation of the Operating Environment. Practice on real problems; create real solutions. Tolerate mistakes. Act on instinct. Take advice to heart. Focus more on what just happened and less on the future. Play jazz. 

Footnotes

¹ Karl E. Weick, “Improvisation as a Mindset for Organizational Analysis.” *Organization Science* Vol. 9, Number 5. September, 1998. 544.

² Ibid.

³ Ibid.

⁴ Christopher Paperone, “New Military Decision-Making Model, A Systems Thinking Approach.” 2009. 17.

⁵ Horst W.J. Rittel and Melvin M. Weber, “Dilemmas in a General Theory of Planning.” *Policy Sciences*, 4, 1973, 161-67.

⁶ Paperone. 27.

⁷ Personal correspondence with Mr. Bill Coffey, Army Space and Missile Defense Command Directorate of Combat Development.

⁸ Photo provided by Mr. Bill Coffey.

⁹ H.R. McMaster, “Learning from Contemporary Conflicts to Prepare for Future War.” Foreign Policy Research Institute, October 2008.

¹⁰ Weick, 547.

¹¹ Ibid, 552.

Characterization of Staffs with High Capability for Improvisation

1. Willingness to forego planning in favor of acting in real time
2. Understanding of organic resources
3. Proficient without specific guidance or analysis
4. Ability to agree on a minimally restrictive plan which facilitates improvisation
5. Open to departure from the Standard Operating Procedures
6. Rich and meaningful themes on which to draw for lines of operation
7. High confidence to deal with non-routine events
8. Skillful at paying attention to the performance of others in order to keep the interaction going and set up interesting possibilities for one another.
9. Preference for process rather than structure